

**REMARKS/ARGUMENT****Regarding the Claims in General:**

Claims 1-19 and 22-26 are now pending. Claims 1 and 8 have been amended to incorporate the features of claims 20 and 21 respectively, and claims 20 and 21 have been canceled without prejudice. Claims 12 has been amended to remove the "such as" clause giving rise to the rejection under 35 U.S.C. 112, and the subject matter of that clause now appears as claim 22. Claims 1, 2, 8, 9, and 11 have been amended to replace the means plus function recitations with structural recitations. Claims 4-7, 13-15, 17, and 18 have been amended to conform to the changes in claims 1 and 8, and these claims, and also claims 1 and 8, have been amended to improve the form thereof in several minor ways. Claims 23-26 have been added to provide applicant with additional protection to which he appears to be entitled in view of the prior art. Except as indicated relative to claims 1 and 8, the scope of the amended claims has not been narrowed.

**Regarding the Prior Art Rejections:**

In the outstanding Office Action, claims 1-4, 8-14, and 20-21 were rejected as anticipated by Gotman U.S. Patent 4,296,542 (Gotman), claims 5 and 15-16 were rejected as obvious over Gotman in view of Atkins et al. U.S. Patent 5,570,032 (Atkins), and claims 6-7, and 17-19 were rejected as obvious over Gotman in view of Spanger U.S. Patent 4,753,863 (Spanger). Reconsideration and withdrawal of these rejections relative to the claims as now presented are respectfully solicited.

Preliminarily, the Examiner's attention is respectfully directed to the fact that claims 1 and 8 now incorporate the features of claims 20 and 21 respectively. Accordingly, claims 1-7, 23, and 24 are now directed to a method of processing an unsingulated array of *packaged semiconductor devices*. Correspondingly, claims 8-19, 22, and 25-26 are directed to an apparatus for processing an unsingulated array of packaged semiconductor devices. Thus, the present invention is concerned with what is generally known in the industry as "back end processing", i.e., processing of fully fabricated semiconductor devices which have been mounted on a substrate and encapsulated with a molding compound.

## Insert A

See, also: *Rappaport v. Dement*, 254 F.3d 1053, 59 U.S.P.Q. 2d 1225 (CAFC 2001); *Jansen v. Rexall Sundown Inc.*, <sup>342</sup> F.3d <sup>1329</sup>, 68 USPQ2d 1154 (CA FC 2003) (phrase; "treating or preventing" in preambles sets forth objective of claimed method, and body of claim directs that method be performed on subject "in need," thus, claimed method is not practiced if claimed vitamins in claimed doses are administered for some purpose other than treating pernicious anemia.)

In contrast, Gotman is concerned only with "front end processing", i.e., the handling of semiconductor wafers before and during dicing into individual dies or circuit chips, initial testing of these chips, and incorporation of the dice into devices on a carrier or substrate. Gotman does not mention molding at all, and the specification does not go beyond a description of the processing steps involved in bonding the chips 10 onto a substrate 132, at which point, the dice are separated from the carrier diaphragm (see col. 7, line 47 through col. 8, line 14).

Those skilled in the art know that front end processing and back end processing are very different, and involve very different technical and practical considerations. Wafer fabrication and dicing requires handling of small, thin, fragile and easily contaminated items. Back end processing requires handling larger plastic-encapsulated elements which begin life as a collection of interconnected parts created into an array when multiple fabricated and assembled circuits mounted, for example, on a lead frame, are simultaneously encapsulated, and which must be separated, tested, and marked in a rapid and reliable manner.

With the foregoing in mind, claim 1 as now presented is directed to a method of processing an *unsingulated array of packaged semiconductor devices*. Gottman is clearly not directed to this subject, and the recitation in the preamble can not be ignored since it gives "life, meaning, and vitality to the claim", see *Kropa v. Robie*, 187 F.2d 150, 152, 88 U.S.P.Q. 478, (CCPA 1951). See, also: *Rappaport v. Dement*, 254 F.3d 1053, 59 U.S.P.Q. 2d 1225 (CAFC 2001); *Jansen v. Rexall Sundown Inc.*, 342 F.3d 1329, 68 USPQ2d 1154 (CA FC 2003) (phrase; "treating or preventing" in preambles sets forth objective of claimed method, and body of claim directs that method be performed on subject "in need," thus, claimed method is not practiced if claimed vitamins in claimed doses are administered for some purpose other than treating pernicious anemia.). The claimed method comprises the steps of:

mounting the unsingulated array [of packaged semiconductor devices] on a mounting device; then

singulating the packaged devices to physically separate the packages;  
and then

testing the singulated packaged devices for defects while they are mounted on the mounting device and without removal therefrom.

As Gotman is concerned only with handling wafers and dice which remain on the diaphragm only until they are attached to substrate 132, there is no teaching in this patent of anything about processing an unsingulated array of *packaged* semiconductor devices, on or off a mounting device. Claim 1 is accordingly not anticipated by Gotman.

Claim 8 is an apparatus claim similar to claim 1. This calls for:

a mounting device for mounting [an] unsingulated array of packaged semiconductor devices;

a singulating device for singulating the array of packaged semiconductor devices; and

a testing device operative to test each of the singulated packaged semiconductor devices for defects;

whereby singulation and testing of the singulated packaged semiconductor devices are conducted while they are mounted on the mounting device without removal therefrom.

Gotman does not disclose an apparatus including the recited elements and therefore does not anticipate claim 8.

Claims 2-4 are dependent on claim 1, and claims 9-14 are dependent on claim 8. These claims, as well as new claim 22, are not anticipated by Gotman for the reasons stated above.

The rejection of claims 5 and 15-18 as obvious over Gotman in view of Atkins is also improper for the reasons stated above. Atkins is directed to wafer scale testing i.e., front end processing, and therefore discloses nothing which remedies the deficiencies in Gotman.

The rejection of claims 6-7, and 17-19 as obvious over Gotman in view of Spanjer suffers from the same fatal deficiency in Gotman as the other rejections. Spanjer has nothing to do with semiconductor processing, but only with a laser markable plastic which can be used for semiconductor packages. Claim 6 is therefore allowable for the same reasons as claim 1.

In addition to the patentable features of claim 1, claim 7 further specifies that:

the mounting device comprises a film of laser transparent tape with an adhesive on one surface. . .

the packaged semiconductor devices are mounted on the adhesive surface of the film of transparent tape; and

marking is effected by passing the laser beam through the film of laser transparent tape toward the adhesive surface thereof, [and that]

the surface of the packaged semiconductor device being marked being the one in contact with the adhesive surface of the tape.

Gotman, of course discloses none of these features (the closest it comes is that the wafers are adhesively attached to the carrier diaphragm), and Spanjer does not help. Spanjer teaches marking through a template or shadow mask. There is certainly no suggestion in this patent of mounting semiconductor packages on a transparent tape as a holder for the semiconductor devices and for marking the devices by irradiating them through the tape, as required by claim 7. Spanjer's shadow mask 14 is essentially the opposite of the claimed transparent tape which has an undifferentiated surface, devoid of any indicia-creating pattern.

Similarly, claim 17 is patentable for the same reasons as claim 8. As to claim 18, in addition to the features of claim 8, this claim specifies that:

the mounting device comprises a film of transparent tape with an adhesive surface on which the packaged semiconductor devices are mountable; and

the laser device is operative to direct the laser beam generated thereby through the film toward the adhesive surface thereof to mark packaged semiconductor devices mounted on the adhesive surface.

Like claim 7, claim 18 is patentable over Gotman in combination with Spanjer because the references fail to teach or suggest a transparent mounting tape through which a laser beam passes to mark a packaged semiconductor device adhesively attached to the opposite side of the tape. Claim 19 is dependent on claim 18, and is also patentable for all the reasons stated above.

New claims 23-26 are directed to additional features of the invention which are not taught or suggested by Gotman, or any of the other references. Claims 23 and 25 specify that "the packaged semiconductor devices are maintained in a substantially coplanar relationship on the mounting device during testing." Even in the context of front end processing, Gotman teaches exactly the

opposite in that the individual dies are displaced from the plane of the other dice by stretching the diaphragm during testing (see col. 6, lines 26-42).

Claims 24 and 26 recite that "the packaged semiconductor devices are tested in subsets selected such that adjacent devices are not tested simultaneously." Gotman only tests one die at a time, and to the extent that references such as Atkins teach testing of multiple circuits simultaneously, there is no suggestion of testing in subsets selected such that adjacent devices are not tested simultaneously.

Claims 23-26 are accordingly allowable along with the other claims.

In view of the foregoing, favorable reconsideration and allowance of this application are respectfully solicited.

#### CERTIFICATE OF MAILING

I hereby certify that this correspondence is being transmitted via facsimile to (703) 872-9306 addressed to: Commissioner for Patents, Alexandria, VA 22313-1450, on February 25, 2004:

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